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(54) **METHOD FOR NEW CONCRETE FROM OLD CONCRETE**

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Related U.S. Application Data

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(51) **Int. Cl.**[7] **C04B 18/04**; C04B 14/04

(52) **U.S. Cl.** **106/705**; 106/668; 106/708; 106/697; 106/738; 106/816; 106/817; 106/819; 106/823

(58) **Field of Search** 106/668, 705, 106/708, 713, 697, 737, 738, 816, 817, 819, 823

(56) **References Cited**

U.S. PATENT DOCUMENTS

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Primary Examiner—Michael Marcheschi

(57) **ABSTRACT**

A method is described for making concrete mixture by blending new batch cement and fly ash with recycled concrete material (curb & gutter, sidewalk, brick, block, asphalt & various other concrete items). This new process will enable discarded concrete materials to be reused as a valuable product.

4 Claims, No Drawings

METHOD FOR NEW CONCRETE FROM OLD CONCRETE

This application is a continuation-in-part of application Ser. No. 09/494,163, filed May 16, 2000.

SUMMARY OF INVENTION

In accordance with the invention, this process takes old concrete, sidewalk, paving, curb, etc. and reuses it to produce a new concrete mixture that is comparable to concrete made with virgin materials. Instead of the old materials being discarded, filling our already limited landfills, they are recycled into a useful and valuable product. Not only will the new concrete mixture create more by volume per weight by using less material in production, but will also be produced at a substantially cheaper cost, enabling this product to be offered on the market, to the consumer, at a reduced rate.

FIELD OF INVENTION

The process relates to an improved usable concrete material, which can be made with less virgin aggregates, by utilizing recycled concrete material and fly ash. Less material is needed to make the same volume of concrete mixture, which is cost effective to produce and just as workable and durable as a virgin concrete.

BACKGROUND OF THE INVENTION

Concrete is a building material made by mixing cement, fine and coarse aggregates in water. The gathering of old concrete, asphalt, brick, block, sand, gravel and other grit type materials normally out of specification in its present state. The old concrete, asphalt, brick, sand, gravel and other grit material being crushed and sized does not have to be any minimum compressive strength to be mixed with new concrete and fly ash. Once virgin concrete is mixed, poured and set, it is unable to be reused for any other purpose, it must then be discarded (most likely to a landfill dump) and replaced with new virgin concrete again. However, by utilizing the crushed recycle method, as described within, the old discarded set concrete can actually be reused in making new concrete mixture. This method will also cut down substantially on the amount of virgin materials needed, not to mention the expense and wastefulness of disposing old concrete in a landfill. By production standards, this method will prove to be not only less expensive to the consumer, but will also preserve our natural resources, a precious commodity. The coarse aggregate used in present invention consists of a mixture of recycled concrete having a size of ¼ to 200 mesh and recycled concrete having a size of 1" to 4 mesh, recycled concrete having a size of ¾" to 4 mesh and recycled concrete having a size of ½" to 4 mesh. The composition according to the present indication can also be bagged.

The following three tables show various concrete compositions and their respective compressive strengths.

The concrete composition has a 28 day composition strength of at most 5070 PSI and a 21 day strength of at least 4093 PSI.

TABLE 1

TEST # #	COMPRESSIVE STRENGTH (lbs.)	DESCRIPTION
1	1010	154 lbs RC6/28 lbs. CEMENT
2	1150	154 lbs. RM6/28 lbs. CEMENT
3	890	154 lbs. RM6/28 lbs. CEMENT
4	1220	70 lbs. RC6/14 lbs. CEMENT
5	1210	154 lbs. RC6/28 lbs. CEMENT
6	1390	154 lbs RC6/28 lbs. CEMENT
7	2140	105 lbs RC6/26.5 lbs. CEMENT
10	1870	87.9 lbs. RC6/27 lbs. CEMENT (wet test)
11	NO TEST	48.6 lbs. RC57/62 lbs. SAND/27 lbs. CEMENT
12	2960	48.6 lbs RC57(washed)/62 lbs. SAND/27 lbs. CEMENT
13	2130	88 lbs. RC6/27 lbs. CEMENT

**Various concrete compositions were made as described in TABLE 1.

TABLE 2

TEST #	@ 7 Days COMPRESSIVE STRENGTHS	Approx. 21 Days	DESCRIPTION
1	1010	1710	154 lbs RC6/28 lbs. CEMENT
2	1150	1720	154 lbs. RM6/28 lbs. CEMENT
3	890	1260	154 lbs. RM6/28 lbs. CEMENT
6	1390	2200	154 lbs. RC6/28 lbs. CEMENT
7	2140	1720	105 lbs. RC6/26.5 lbs. CEMENT
8	4230	5110	62 lbs. SAND/90 lbs. GRAVEL/26.5 CEMENT
9	4430	5410	65 lbs. SAND/90 lbs BLUE STONE #57 26.5 CEMENT
10	1870	2340	87.9 lbs RC6/27 lbs CEMENT (wettest) 48.6 lbs. RC57 (washed/62 lbs SAND
12	2960	4090	27 lbs. CEMENT
13	2130	2870	88 lbs. RC 6/27 lbs. CEMENT

**Various concrete compositions were made as described in TABLE 2. Test #8 and Test #9 are comparative samples using virgin aggregate.

*RC6 is recycled material having a 1½" to 200 mesh.

*RM6 is recycled material having a 1½" to 200 mesh.

*RC57 is recycled material having a 1" to 4 mesh.

*RCPea is recycled material having a ½" to 200 mesh.

*RC1/4 is recycled material having a ¼" to 200 mesh.

TABLE 3

Test Pour of February 24, 1999

TEST #	@ 7 Days COMPRESSIVE STRENGTHS	@ 28 Days	DESCRIPTION
14	530	810	60 lbs RC6/1.3 lbs. FLY ASH/10.3 lbs. CEMENT
15	1680	2830	26.6 lbs. RC57/20 lbs. SAND/4.6 lbs. FLY ASH/8.8 lbs. CEMENT
16	1290	1950	30 lbs. RC6/13.3 lbs. SAND/8.8 lbs CEMENT
17	2940	4240	26.6 lbs. C\RC57/23.3 lbs. SAND/10.0 lbs. CEMENT
18	1410	1700	31.6 lbs. RC6/16.6 lbs. SAND/10.0 lbs. CEMENT
19	4280	5550	26 lbs. RC57/49 lbs. SAND/15 lbs. CEMENT
20	3900	4680	49 lbs. RCPea/26 lbs. SAND/1.3 lbs. FLY ASH 10 lbs. CEMENT
21	4480	5070	49 lbs. RCPea/26 lbs. SAND/16 lbs. CEMENT

TABLE 3-continued

Test Pour of February 24, 1999

TEST #	@ 7 Days COMPRESSIVE	@ 28 Days STRENGTHS	DESCRIPTION
22	2750	3640	45 lbs. RC1/2-#200/26 lbs. SAND/1.3 lbs FLY ASH/10 lbs. CEMENT
23	2260	3240	49 lbs. RC1/2-#200/26 lbs. SAND/10 lbs. CEMENT
24	2750	3240	29 lbs. RC57/16 lbs. SAND/11 lbs. CEMENT
25	2760	3280	28 lbs. RC1/4-#200/16 lbs. SAND/11 lbs. CEMENT
26	4030	5070	40 lbs. RC1/4-#200/4 lbs. SAND/13 lbs. CEMENT
27	4020	5070	28 lbs RC1/4-#200/16 lbs. SAND/17 lbs. CEMENT

**Various concrete compositions were made as described in TABLE 3.

*RC6 is recycled material having a 1½" to 200 mesh.
*RM6 is recycled material having a 1½" to 200 mesh.
*RC57 is recycled material having a 1" to 4 mesh.
*RCPea is recycled material having a ½" to 200 mesh.
*RC1/4 is recycled material having a ¼" to 200 mesh.

What we claim is:

1. A concrete composition consisting of portland cement, fly ash, sand, water and a coarse aggregate, wherein the coarse aggregate consists of a mixture of (a) recycled concrete having a size of 1½" to 200 mesh (b) recycled concrete having a size of ½" to 200 mesh, (c) recycled concrete having a size of 1" to 4 mesh (d) recycled concrete having a size of ¾" to 4 mesh and (e) recycled concrete having a size of ½" to 4 mesh, and (f) recycled asphalt said composition having 28 day compressive strength of at most 5070 PSI and a 21 day strength of at least 4093 PSI.

2. A bagged concrete composition consisting of portland cement, fly ash, sand and a coarse aggregate, wherein the coarse aggregate consists of a mixture of (a) recycled concrete having a size of 1½" to 200 mesh (b) recycled concrete having a size of 1" to 4 mesh (c) recycled concrete having a size of ¾" to 4 mesh, (d) recycled concrete having a size of ½" to 200 mesh, (e) recycled concrete having a size of ½" to 4 mesh and (f) recycled asphalt, said composition having a 28 day compressive strength of at most 5070 PSI and a 21 day strength of at least 4093 PSI.

3. A concrete composition consisting of portland cement, fly ash, sand, water and a coarse aggregate, wherein the coarse aggregate consists of a mixture of (a) recycled concrete having a size of ¼" to 200 mesh, (b) recycled asphalt, said composition having 28 day compressive strength of at most 5070 PSI and a 21 day strength of at least 4093 PSI.

4. A bagged concrete composition consisting of portland cement, fly ash, sand and a coarse aggregate, wherein the coarse aggregate consists of a mixture of (a) recycled concrete having a size of ¼" to 200 mesh (b) recycled asphalt, said composition having a 28 day compressive strength of at most 5070 PSI and a 21 day compressive strength of at least 4093 PSI.

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